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The role of sensory diet in minimalization of food selectivity in children with autism spectrum - case study

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Abstract

In the group of disorders in children with autism spectrum observed food selectivity. The article presents a case study of a therapeutic program applied to a child with food selectivity.
A 5-year-old boy with a diagnosed autism spectrum was selected for the observation. The criterion for including the child in the observation was the diagnosed food selectivity and hypersensitivity of the touch system. For this purpose, a detailed interview with parents and medical consultations were made during which food selectivity due to metabolic disorders was excluded. The boy participated in a six-month therapy conducted once a week by the Sensory Integration method. The research was conducted from July to December 2018.
The child was observed to minimize the degree of hypersensitivity of the tactile system after a period of 3 months of the sensory diet. After 6 months of treatment, a significant progress was observed in the widening of the boy's nutritional repertoire. Currently, the child eats most of the food without diversifying the food structure.
In the child's case study analyzed, the effectiveness of Sensory Integration therapy applied in food selectivity was confirmed. The effectiveness of stimulation of Sensory Integration Therapy is an opportunity to improve the minimization of food choices in children with the autism spectrum.

Key words: selectivity food, sensory diet, autism, Sensory Integration

INTRODUCTION

Sensory processing is a process involving the recording, selection and processing of information received by sensory systems from one's own body and the external environment, which consequently evokes an appropriate response that allows modifying and adapting the environment to one's needs. The first years of a child's life is a period of intensive development and gaining new experiences. The proper functioning of sensory systems is the basis for the maturation of the human body. Disorders of these processes in the central nervous system contribute to the occurrence of disturbances in emotional, social and family life. The changes most visible in the behavior of the child are most often seen by parents who wonder about their cause [1].

Child autism is a holistic development disorder that affects all spheres of child's functioning and lasts throughout life. The disorder occurs 3 to 4 times more often in boys than in girls. According to the current diagnostic criteria, abnormal development of the child is most often visible before the third year of life. During this period, the child's abnormal or impaired development usually refers to the linguistic understanding and expression used in social communication, the development of selective social attachment or social interactions, or improper functional or symbolic fun. Autistic disorders have a very diverse character, do not form a uniform image both as to symptomatology and depth of disorders. It is known that irregularities must occur in the three mentioned spheres, ie the sphere of social interactions, communication and limited, repetitive behaviors [2,3].

There are many factors affecting the occurrence of irregularities in the process of sensory integration, which may occur at any stage of development. The most extensive damage is caused by disturbances on the lowest, basic floors of sensory integration processes, because they make it impossible to build a foundation for the formation of complex sensomotor skills. In the group of sensory processing disorders, sensory modulation disorder (SMD) is distinguished. The SMD type is most common in children with the autism spectrum and it illustrates how to adjust sensory impressions. This category of disorders is diagnosed when one or more disturbing symptoms occur, with a specific intensity (searching or avoiding stimuli), which last longer than a few minutes and are repeated several times a day [4,5]. There are three basic types of answers in the SMD category: hyper-responsiveness, sub-reactivity, and the search for sensory stimuli. Sensory Overresponsivity (SOR), defined as hypersensitivity, means excessive, exaggerated reaction to sensory impressions. It is associated with a reduced threshold of excitability to sensory stimuli. Such children perceive much more environmental stimuli, and the reaction to their excess may be irritability or the adoption of an avoiding attitude. Therefore, a child may exhibit different types of behavior depending on which of the senses are affected by incoming stimuli. The second type of response from the SMD category is sensory sub-responsiveness (SUR). It is characterized by an increased threshold of excitability to sensory stimuli, so-called podwrażliwość. A child representing this type of disorder needs strong strengthening of the stimuli that reach him to be able to achieve the correct threshold of sensory stimulation. As in the previous case, the image of the reaction to the sensory experience depends on the type of stimulus, but here the child takes a withdrawn, often passive attitude. Searching for sensory stimuli (from Sensory Seeking - SS) is another type of response in the SMD category. The person presenting this type of disorder needs strong sensory impressions, as in the case of SUR, but for a change, she is constantly looking for stimulation [6, 7].

In order to minimize the occurrence of disturbances in the regulation of sensory processes, an individually constructed sensory diet for the child's needs is used. When planning a proper sensory diet, the child's sensory needs should first be understood in relation to sensory integration disorders and their impact on the behavior of the child [8]. The sensory diet is a term introduced by P. Wilbarger and means a child-specific activity program

specifically developed that provides the nervous system with the right sensory stimuli. Children with a high level of arousal require a diet that includes silencing activities that inhibit agitation. Children too calm require activity that stimulates the nervous system. Unfortunately, sometimes it is erroneously talked about sensory diet only in the case of tactile hypersensitivity [9,10]. Currently, the concept of sensory diet refers to various sensory integration disorders and is used in all types of disorders. The program of sensory diet is not simply adding more sensory impressions to the activity of everyday life. One of the most important guidelines when constructing a diet is to create a set of exercises that will protect the child's nervous system from overload and the emergence of negative emotional reactions [11]. If the diet is properly adjusted, it can protect the child against autostimulatory and autoaggressive behaviors. It is used to restore the right balance of over-stimulated or over-inhibited nervous system. Sensory diet, providing the right sensory stimuli, improves concentration and communication. The diet includes a program of individual exercises, information provided to parents or teachers with tips on what to avoid in everyday activities of the child at each stage of the recommended diet not to aggravate the already existing disorders. This technique is not just a constant set of the same exercises and recommendations but it is a constantly modified system adapted to changes in the behavior of the child's procedures [12,13].

Particularly noteworthy is the fact that in the proper assimilation of food by a child with a diagnosed spectrum of autism provides a sense of smell. The smell of cabbage, brussels sprouts or fish in a child's hypersensitive olfactory may provoke the onset of a gag reflex. The food should then have a mild taste and no smell. However, if the child has too little olfactory sensitivity, even his own feces may be attractive for him. In this case, care should be taken for olfactory training and for a meal that is rich in intense aroma. The child should always receive information about what he / she receives for eating. In a fairly large group of children from the autism spectrum, there are many rituals associated with eating meals [14]. Some children eat, for example, only white foods, in a fixed order, at a specific place, etc. Rituals are often the result of anxiety and result from a lack of sense of security. It is worth helping your child to minimize the occurring rituals. The first step should be to make all rules and rituals become common. The schedule of the day, based on characters or words, should be created together with the child, where you should plan the time and place for the meal well. If the child needs a structure, it is necessary to ensure that everything takes place under common conditions, respecting the individuality of each person in the family [15].

The aim of the article is to show the role of a sensory diet in minimizing food selectivity in a child with a diagnosed spectrum of autism based on a case study description.

MATERIAL AND METHODS

The goal was to describe the individual case study of a child with a diagnosed autism spectrum. A 5-year-old boy with a diagnosed autism spectrum was selected for the observation. The inclusion criterion for choosing a child for observation was diagnosed food selectivity. For this purpose, a detailed interview was conducted with parents and medical consultations during which food selectivity due to metabolic disorders was excluded. The boy participated in a six-month therapy conducted once a week by the Sensory Integration method at the institution of the National Autistic Society in Kielce. The research was conducted from July to December 2018. Before the therapy was started, a detailed diagnosis of the sensory profile of children was made. A professional diagnosis was carried out by a certified sensory integration therapist. Before starting work with a child with sensory integration disorders parents were made aware of the problem. The written consent of the parents was obtained to conduct observations and to document the obtained results. Diagnostics included a detailed interview with parents using the tool Sensomotor Development Questionnaire, systematic

observation of the boy during therapeutic visits, observation of the child's free behavior in the therapeutic room and the implementation of specialized Clinical Observation Tests and South California Tests. Parents are the best observers of the child's behavior, therefore the therapist established close cooperation with them in order to facilitate the child's proper functioning. During the first meeting with the therapist, the parents received a questionnaire to help the therapist know the sensory and motor history of the patient. After careful analysis, the therapist decided to take the therapy. The questions contained in the questionnaire concerned the level of activity, self-regulation, behavior and the child's reaction to individual sensory impressions.

RESULTS

The parents of the child participating in the therapy reported the main problem of food specificity. The interview conducted using the tool of the Sensomotor Development Questionnaire and clinical observation of the behavior of the examined children together with diagnostic tests revealed disturbances in the modulation of sensory systems.

The analyzed case was Michał, who was diagnosed with disturbances of modulation of sensory processes with the features of hypersensitivity of the tactile system. The child was not diagnosed with sensory processing disorders of the olfactory system and taste. Before beginning the therapy, the boy did not like to be touched / hugged and responded to the touch, as if he was painful or unpleasant. The child did not like to touch new and different textures, avoided playing in the sand, painting with his hands, he did not like to be undressed. He reacted excessively when he was touched unexpectedly, he did not like to walk barefoot. The boy did not like washing face, combing, cutting hair, brushing teeth, cutting nails, bathing. In his nutritional repertoire, the child only tolerated a milk soup with heavily soaked cornflakes for breakfast, the most common lunch was broth with finely chopped noodles. However, for supper, the boy ate sausages with a soft roll. The boy avoided eating hard foods. The child's repertoire before the start of therapy was very modest. The peasant did not eat any vegetables or fruits, sometimes the parents managed to add a carrot to the broth, but it must have been very overcooked. The parents of the child tried to cook vegetables / fruits although the boy refused to try. For about 2 years, parents sought different methods to make the child want to expand their dietary repertoire. One of the methods was cooking through play, shopping together, giving the child small nutritional novelties to consistencies tolerated to the child. The parents used the help of a dietitian and a family doctor. However, the boy continued to eat a rigid dietary repertoire. However, the attempt to provide nutritional novelty pretended to have difficult behaviors in the form of a strong scream and crying.

Initially, the therapy consisted of limiting the amount of dishes on the plate. The parents of the child were asked to be served not very hot meals. It was recommended to give the ice cubes to the child before the meal together with the addition of the following breathing games: blowing soap bubbles, whistling. The child's parents were instructed on how to conduct a deodorizing training in the oral sphere. The technique of training consisted of lightly patting, tapping and chin, chin, and lips by using a teaspoon and fingertips. Subsequently, it was recommended to stroke the lips with a finger, then with a brush and finally with a brush. Then the parents of the child passively exercised strong and quick stretching of the lips alternately with a click; successively exaggerated and expressive pronunciation of "u" and "o" vowels was performed. The child was very keen to take part in the training, therefore the next stage of therapeutic treatment could be continued. It consisted in rubbing the tongue with teeth and pressing the tongue through dense teeth with the active participation of the child. Then, the child's parents exercised hard pressure of the temporomandibular joints simultaneously on both sides, so that they could then massage them with varying degrees of severity. One of the last stages of the training, which was used to

press the index finger on the tip of the tongue, with gradual sliding the finger towards the root of the tongue. The final stage was massaging the lips and the tongue with an electric toothbrush for cleaning the teeth (initially it was done through the material, later directly). Initially, the electric tooth through the material was massaged lip area - this stage lasted two months to be able to continue training inside the mouth. The training was systematically performed by parents for 4 months with regularity 6 times during the day, initially 30 seconds until the final stage of 5 minutes. During the training, the parents were told to give him dried fruit. Parents were instructed to give the child a thin jelly or mousse of overcooked apples to drink through the tube. Then began to introduce flavors initially from salty through sweet to sour and bitter. Training in this case began with giving the taste that the child tolerated best. It was a sweet taste, therefore a sugar cube was placed between the child's teeth and cheek. It is important that the child would not chew on this taste. It was pointed out that the given flavor should freely dissolve in the mouth towards the tongue. Exercises were performed with every taste for a period of about a week - from four to eight trials a day. It was recommended to season the dishes to prevail the taste currently being introduced. It was only when the boy learned to tolerate the flavors that he began to teach him to distinguish them, giving him something to try and saying what it is. An important aspect of the therapy was the fact that the child eating chews every dish. The child was also diagnosed with the overall disturbances of modulation of sensory processes of the touch system. In connection with the above, along with the training of the oral sphere desensitisation, a number of global tactile stimuli that affect the whole body of the child were also used. Initially, proprioceptive proprioceptive head, shoulder girdle, forearm hands and lower limbs were made. Subsequently, the child was touched with materials of different textures, where at the beginning the boy chose the type of material structure. Subsequently, the child's parents were instructed to perform thermal stimulation, where hot and cold compresses of bottles filled with hot and cold water were used alternately. The child was very keen to get involved in the proposed activities, therefore the next step was to put the hands and legs into the pool filled with balls, and then start the touch discrimination training. It consisted in searching by the child for hidden, small objects in containers filled with various masses, i.e. rice, beans, pasta, shaving foam, and kinetic sand. In addition, the parents were advised to choose clothing materials accepted by the child. Subsequently, a detailed instruction was provided on the implementation of the sensory diet at home, i.e. the use of deep compression massage together with joint compression. While washing the body, it was recommended to wipe the child with a strong pressure. While washing the head, cutting the nails was instructed to make strong pressures beforehand on the hygienic area of the body.

In the child, a tendency to minimize the degree of hypersensitivity of the tactile system of the global sphere after a period of 3 months of the sensory diet was observed. After 6 months of therapy, a significant progress was observed in the widening of the boy's nutritional repertoire. Currently, the child eats most of the food without diversifying the food structure. After the therapy, the boy still attends the classes, although they are held once a month.

DISCUSSION

The effectiveness of minimizing food selectivity in the analyzed case study, thanks to the use of Sensory Integration stimulation, is confirmed by other authors in their research. According to C. Delecato, the basic problems with eating in children with autism arise from the problems of distinguishing flavors. Children who are too sensitive have problems with food intake, which adversely affects their health. In turn, children with too little taste sensitivity exhibit destructive behaviors for themselves because of the tendency to eat anything that attracts them with color or smell. These children can eat anything to have an intense taste. Delecato, when examining the problem of food selectivity in children with

autism spectrum, noted that one of his students had a particular taste for blue oil paint and other chemicals. It is obvious, therefore, that there should not be any substances or liquids in the home of such a person or in the school, the intake of which could be dangerous. C. Delecato, in his articles, solves the solution of the analyzed problem by applying appropriate sensory trainings. According to the author, if a child exhibits hypersensitivity to taste, he should initially receive delicate sweet or salty foods in which there are no spices. C. Delecato said in his research that the daily taste training should consist of four to eight tastes. Do not forget about the place of administration of the given taste in the mouth. The most sensitive to the taste of sweet and salty is the tip of the tongue, the sides of the tongue react to the sour taste, and the back to bitter. Once the child has learned to recognize the flavors, you can change the flavors every day in the given order, i.e. sweet, bitter, sour and salty. When this training is no longer difficult, you can start to exchange flavors throughout the day. The child should not get any carbonated beverages, because these reinforce the flavors. New food with a sour or bitter taste should be given to the child in small amounts mixed with other, known and accepted food. The meal constructed in such a way should first put the child on the palate of the tongue, and then on its top always calling what it tastes like. By repeating this procedure many times and patiently, according to the author, you can tame your child with every taste [16]. According to J. Bluestone, the sources of nutrition problems experienced by people with the autism spectrum should be sought in the disturbances of sensory processes related to feeling, feeling different foods in the mouth and hypersensitivity to sounds. J. Bluestone draws attention in particular to the difficulties in people with autism spectrum related to the process of chewing food. Chewing is the beginning of the digestive process that begins in the mouth. A large percentage of children with a diagnosed spectrum of autism do not bite food, but swallow it in large chunks. Food reaches the intestine unprepared for mechanical and chemical processing that should take place there. Food can not be absorbed in the intestines because of the unprocessed content. Another reason for not being able to eat food may be the lack of secretin. According to Bluestone, most children in the autism spectrum suffer from a sensory disorder in the mouth and therefore do not tolerate the sensation that biting food. An additional difficulty may be impaired muscular tension, which determines the strength with which you can use a group of individual muscles. Therefore, some people with autism spectrum may bite the other person's hand very painfully, which they perceive as a threat, or constantly chew the pieces of film, but are not ready to perform a series of coordinated movements related to survival and swallowing. Sensory problems are extremely important when it comes to eating. The expected unpleasant consistency of the food may prevent the person with autism from accepting or swallowing the food at all. Another important reason for trouble with chewing is hypersensitivity to sounds. For a person with autism spectrum, e.g. noises coming out during eating, may be difficult to accept. Bluestone observed in her research that despite the pain associated with chewing, some people with autism are constantly chewing styrofoam or small pieces of plastic, which according to the author may result from a strong need for immutability. Eating during chewing changes its consistency, while plastic does not [17].

CONCLUSIONS

The effectiveness of the applied sensory stimulation therapy is an opportunity to improve the minimization of food choices in children with the autism spectrum. Particularly noteworthy is the individuality of adapting the forms and therapeutic measures applied to each child. In the child's case study analyzed, the effectiveness of Sensory Integration therapy in food selectivity was confirmed.

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